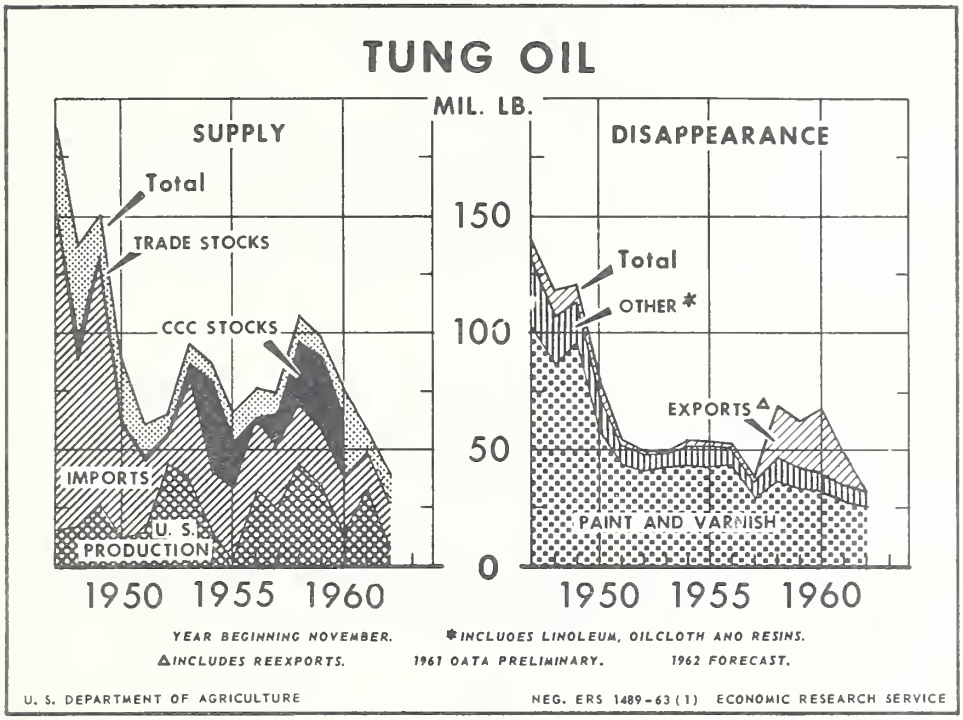
TUNG OIL SUPPLIES SCARCEST SINCE WORLD WAR II

by
George W. Kromer



U. S. tung oil supplies in 1962-63 are forecast at 39 million pounds, roughly 19 million less than in 1961-62 and the smallest since the oil-short days of World War II. Freeze damage reduced the 1962 tung oil crop to an estimated 6 million pounds, only one-fifth as large as that a year earlier. Thus, domestic requirements will need to be met chiefly through imports from Argentina and Paraguay.

Domestic disappearance of tung oil in 1962-63 is forecast at 33 million pounds, 10 percent less than in 1961-62. Sharply reduced supplies of tung oil along with the highest prices since the spring of 1952 will encourage drying oil users to shift to substitutes where possible. (See page 25).

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Tung Oil Supplies Scarcest Since World War II

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George W. Kromer

Supplies of tung oil in the United States during the 1962-63 marketing year, which began November 1, are the smallest since the oil-short days of World War II. Prices are expected to continue at levels higher than those of 1961-62.

The 1962 tung nut crop is estimated at 21,800 tons, only one-fifth as large as a year earlier and the least since 1955. Freeze damage in March 1962 reduced the crop sharply in all the major producing States--Alabama, Florida, Louisiana, and Mississippi. If the oil yield per ton of nuts crushed is about 320 pounds, roughly the same as last year, domestic tung oil output in 1962-63 will total around 6 million pounds compared with 33 million last year and the record 45 million pounds in 1958-59.

Tung Output Fluctuates Sharply Year-to-Year

U. S. tung production began on a commercial scale in the late 1930's and has shown a secular uptrend to the 1958 crop, which was a record 146,700 tons of nuts. Because of adverse weather conditions, the 1959 crop dropped to 110,600 tons, and the 1960 crop was only 42,600 tons. Tung orchards are sensitive to weather (freeze damage) and cyclic factors. Consequently, wide year-to-year variations in nut production occur (table 17). The 1961 crop (111,500) tons was damaged somewhat by frost, and the 1962 crop was nearly wiped out due to cold damage.

Tung trees bloom in early spring. The harvest begins in October and extends to February. Milling of the fruit continues through the harvest period into late spring and as late as July. Because the hulled fruit deteriorates in storage, crushing is completed as rapidly as possible after harvest. There is no carryover of fruit from one season to another. Thus, the annual production of nuts and the production of oil are directly related.

The tung belt is about 100 miles wide along the Gulf Coast from north central Florida into eastern Texas. Freeze damage will continue to be a problem until researchers develop later-blooming varieties. New plantings of tung trees in recent years have been mainly for replacement or for better utilization of old plantings. Consequently, even with favorable weather, production in the next several years is not likely to increase significantly over the 1958 record level.

The season-average price received by growers for 1962-crop tung nuts is $107 per ton, $20 higher than last year and sharply above support. Support for 1962-crop nuts has been set at $63.34 per ton (80.9 percent of the November 1962 parity price of $78.30 per ton), with an equivalent support of 24 cents per pound for tung oil. The 1962 support price is the same as in 1961. Purchase agreements and loans on tung oil are available through June 30, 1963. Loans

Table 17.--Tung nuts: Production, price received by growers, and value of production, by States, 1945-62

State	Production 1/									
	Average 1945-49	Average 1950-54	1955	1956	1957	1958	1959	1960	1961	1962
	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons
Mississippi	26.7	42.2	2/	66.8	52.1	84.8	60.7	29.0	62.2	11.0
Florida	13.6	20.3	6.2	16.5	16.0	35.0	29.0	2.3	30.9	8.0
Louisiana	16.1	13.2	2/	19.0	13.7	22.7	18.0	10.9	16.1	2.2
Alabama	1.3	1.7	2/	1.1	.7	3.8	2.7	.4	2.0	.6
Georgia	1.1	.4	2/	.1	.1	.4	.2	3/	.3	3/
United States	58.8	77.7	6.2	103.5	82.6	146.7	110.6	42.6	111.5	21.8
	Season average price to growers, per ton 1/									
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
Mississippi	76.00	84.20	---	52.00	51.00	52.00	52.00	62.00	90.00	105.00
Florida	73.60	88.40	64.00	58.00	60.00	58.00	54.00	65.50	80.00	110.00
Louisiana	73.80	78.20	---	54.00	48.00	50.00	51.00	63.00	92.00	105.00
Alabama	73.86	87.40	---	58.00	57.00	56.00	54.00	63.00	81.50	105.00
Georgia	4/	4/	---	4/	4/	4/	4/	4/	4/	4/
United States	74.70	84.60	64.00	53.40	52.30	53.20	52.40	62.50	87.30	107.00
	Value of production									
	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars
Mississippi	1,938	3,398	---	3,474	2,657	4,410	3,156	1,798	5,598	1,155
Florida	958	1,624	397	957	960	2,030	1,566	151	2,496	880
Louisiana	1,152	975	---	1,026	658	1,135	918	687	1,481	231
Alabama	184	170	---	67	46	235	157	25	163	63
Georgia	4/	4/	---	4/	4/	4/	4/	4/	4/	4/
United States	4,232	6,166	397	5,524	4,321	7,810	5,797	2,661	9,738	2,329

1/ Production and price in terms of air-dried nuts in the husk.

2/ Less than 50 tons.

3/ Negligible.

4/ To avoid the possibility of disclosing individual mill operations, the prices and values for Georgia and Alabama have been combined under Alabama, 1945-60. Florida and Georgia combined in 1961-62.

mature October 31 or earlier on demand by CCC. Under existing legislation, tung nuts must be supported at not less than 65 percent of the parity price in any crop year in which the Secretary of Agriculture determines that domestic production of tung oil will be less than the anticipated demand. CCC is not expected to acquire any tung oil in 1962-63, as was the case last year.

Tung Oil Consumption Probably Will Be Curtailed Again This Year

Carryover stocks of tung oil on November 1, 1962, were nearly 13 million pounds. Imports of tung oil during 1962-63--mainly from Argentina (where tung nut production is up slightly this year) and Paraguay--are forecast at about 20 million pounds compared with 17 million last year. If the estimates of 1962 oil production, imports, and starting stocks are reasonably accurate, total domestic supplies of tung oil will be around 39 million pounds, roughly 19 million less than the year before and the lowest in the postwar era. (See cover chart).

Domestic use of tung oil in 1962-63 is forecast at around 33 million pounds, down slightly from the previous year and the smallest since the mid-1940's. Sharply reduced supplies of tung oil along with high prices will encourage drying oil users (manufacturers of paints, varnishes, lacquers, resins linoleum, insulation, hard-board and oil cloth) of tung oil to shift to substitutes where possible.

During the 1957-61 crop years, U. S. production of tung oil averaged about three-fourths of annual domestic requirements. The balance necessary for U. S. consumption was imported largely from Argentina and Paraguay. Import quotas restricted quantities to the U. S. at 26 million pounds until May 1962, when quotas were removed following disastrous frost damage to the domestic crop in March 1962 and the liquidation of the CCC tung oil inventory.

Consumption of tung oil has been severely cut back in the postwar era, dropping from 130 million pounds in 1947-48 to 36 million in 1961-62. This is the lowest use rate for tung oil since World War II, when imports of this commodity were cut off. The development of new synthetic types of coatings and unstable supply and prices for tung oil have led industrial users to substitute other materials and lower priced drying oils such as tall oil. Today, tung oil accounts for less than 5 percent of the market for drying oils compared with 12 percent in the earlier period.

Until World War II, natural oils (mainly linseed oil) were the principal vehicles used in the manufacture of protective coatings. Since then, the protective coating industry has shifted from natural oils to synthetic materials, resulting in a continuing downtrend in total fats and oils consumption for this purpose.

Lost oil markets in the protective coatings industry are difficult to regain. Recent research developments offer promise for new uses of tung oil

Table 18.--Tung nuts: Supply, disposition, and price, 1939-62

Year beginning November	Supply			Disposition		Price per ton		Oil yield per ton crushed
	Production	Imports	Total	Crushings	Residual	Season average	Support	
	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	Dol.	Dol.	Lb.
1939	1.2	---	1.2	(1.2)	---	42.20		
1940	11.0	---	11.0	(11.0)	---	60.00		
1941	8.7	---	8.7	(8.7)	---	88.30		
1942	16.4	---	16.4	16.4	---	91.80		316
1943	6.2	---	6.2	5.5	.7	99.00		341
1944	26.7	---	26.7	27.3	-.6	102.00	100.00	321
1945	37.1	---	37.1	27.5	9.6	98.90	101.25	332
1946	57.4	---	57.4	45.1	12.3	96.90	---	319
1947	53.2	---	53.2	50.6	2.6	64.90	72.00	316
1948	58.5	2.7	61.2	50.3	10.9	49.10	---	339
1949	87.9	.3	88.2	83.1	5.1	63.70	60.00	322
1950	36.5	---	36.5	35.8	.7	111.00	63.00	343
1951	49.1	.1	49.2	48.5	.7	106.00	67.20	303
1952	132.1	.5	132.6	129.5	3.1	79.80	67.20	335
1953	120.0	---	120.0	112.6	7.4	66.80	63.38	352
1954	51.0	---	51.0	46.6	4.4	59.40	54.96	325
1955	6.2	.5	6.7	1/	---	64.00	51.06	---
1956	103.5	---	103.5	100.2	3.3	53.40	53.76	319
1957	82.6	---	82.6	80.7	1.9	52.30	52.13	315
1958	146.7	---	146.7	143.4	3.3	53.20	53.89	312
1959	110.6	---	110.6	105.7	4.8	52.40	53.50	322
1960	42.6	---	42.6	37.6	5.0	62.50	53.50	346
1961	111.5	---	111.5	102.7	8.8	87.30	63.34	317
1962 2/	21.8	---	21.8	20		107.00	63.34	

1/ Negligible. 2/ Preliminary. Crushing is forecast.

Table 19.--Tung oil: Supply, disposition, and price, 1935-62 1/

Year beginning November	Supply					Disposition		Price per pound			Oil acquired by CCC
	Production	Imports	Stocks Nov. 1		Total	Exports 2/	Domestic disappearance	Drums, N.Y. (imported)	Tanks f.o.b. mills 3/	Support	
			CCC	Total							
	Mil.lb.	Mil.lb.	Mil.lb.	Mil.lb.	Mil.lb.	Mil.lb.	Mil.lb.	Ct.	Ct.	Ct.	Mil.lb.
Average 1935-39	.6	123.2	---	37.9	161.7	5.7	118.1	18.2			
1942	5.2	4/	---	31.4	36.7	1.8	5/11.5	39.0			
1943	1.9	1.8	---	28.7	32.3	.7	5/10.5	39.0			
1944	8.8	.3	---	22.8	31.9	2.5	21.7	39.2		36.0	---
1945	9.1	24.5	---	7.7	41.3	.9	33.2	39.2		6/36.0	---
1946	14.4	103.4	---	7.2	125.0	6.0	87.1	32.4		---	---
1947	16.0	140.4	---	31.9	188.4	10.4	130.4	25.2		25.0	7.8
1948	17.0	72.4	7.8	47.6	137.0	10.9	107.7	23.4		---	---
1949	26.8	105.9	---	18.5	151.1	8.2	112.5	26.5	25.1	24.1	1.6
1950	12.3	48.2	1.6	30.5	91.0	6.4	5/72.4	38.2	36.7	25.1	---
1951	14.7	30.4	1.6	16.0	61.2	1.3	51.2	40.8	39.1	26.5	---
1952	43.4	13.0	.5	8.7	65.1	.3	49.6	31.3	28.6	26.5	5.8
1953	39.6	41.5	5.8	15.1	96.3	.3	49.3	24.3	23.8	23.9	32.8
1954	15.2	25.2	38.6	46.7	87.1	3.6	51.2	25.1	23.3	21.2	4/
1955	2.2	31.4	19.2	32.4	66.0	1.4	51.6	26.2	24.4	20.0	---
1956	32.0	31.5	.4	13.0	76.5	1.3	50.4	24.7	22.7	21.0	15.0
1957	25.5	24.7	15.0	24.8	75.0	.4	37.7	23.2	21.4	20.5	11.1
1958	44.8	25.0	25.8	36.9	106.6	7/20.7	47.4	24.1	21.9	21.0	24.6
1959	34.0	26.0	30.0	38.5	98.5	7/19.2	42.0	24.0	21.9	20.9	16.1
1960	13.0	25.8	25.5	37.3	76.1	7/26.4	41.5	28.2	26.6	20.9	---
1961 8/	32.6	17.1	---	8.2	57.9	11.3	5/35.9	37.6	35.2	24.0	---
1962 9/	6	20	---	12.5	39	---	33			24.0	---
1963 9/				6							

1/ Data by crop year not available until 1942-43. 1935-39 calendar year average. 2/ Includes reexports. 3/ Not available before April 1949. 4/ Less than 50,000 pounds. 5/ Factory consumption figures used for years in which reported factory consumption exceeds domestic disappearance. 6/ Processor had to agree to buy back oil at 37 cents a pound or else CCC would purchase oil only at 30 cents a pound. 7/ CCC export sales. 8/ Preliminary. 9/ Forecast except November 1, 1962 stocks.

in such products as latex and fire-retardent paints. However, there likely will be a considerable gap between the time when tung oil supplies and prices return to normal and new market outlets become available.

Tung Oil Prices Highest Since Spring 1952

Monthly average tung oil prices (imported, tanks, New York) generally trended upward from 21.3 cents per pound in February 1960 to 40 cents in December 1962. The sharpest increase occurred in calendar 1962, the annual average being 37.5 cents per pound compared with 27.7 cents the year before. Current prices of tung oil are the highest since the spring of 1952. Due to the tight supply situation, prices during 1963 likely will continue strong, probably averaging at their present peak level of more than 40 cents per pound. Prices of tall oil, linseed oil, dehydrated castor oil, and imported oiticica oil have shown considerably less variation than tung oil.

Current indications are that a tight world supply situation is ahead for 1963, because Red China, a major but inconsistent supplier is expected to ship at the reduced level of the past few years, presumably because of a decline in production. Also, world stocks of tung oil are at a low level. Annual world consumption is being reduced because of limited supply. On balance, it appears that there will be a world deficit.

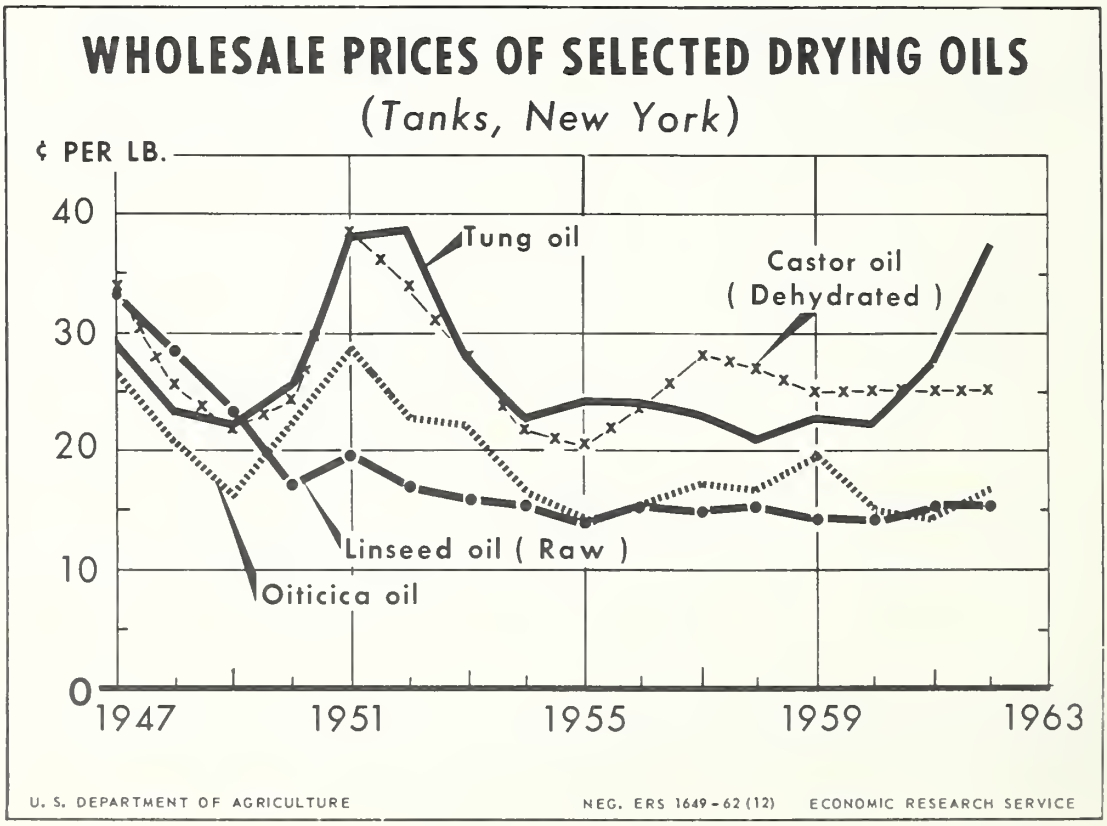

Table 20.--Tung oil: Utilization, year beginning November 1947-61 1/

Year beginning November	Drying oil products				Total domestic disappearance
	Paint and varnishes	Linoleum and oilcloth	Resins	Other	
	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.
1947	102.3	8.7	---	19.4	130.4
1948	86.2	11.3	---	10.2	107.7
1949	96.5	5.8	---	10.3	112.5
1950	57.3	2.3	---	9.7	2/72.4
1951	43.4	.6	2.4	4.7	51.2
1952	41.1	.4	4.2	3.8	49.6
1953	43.6	.5	3.0	2.2	49.3
1954	43.8	.3	3.7	3.4	51.2
1955	43.0	.3	4.4	3.9	51.6
1956	43.8	3/	3.4	3.3	50.4
1957	29.0	---	3.1	5.6	37.7
1958	39.9	---	4.4	3.1	47.4
1959	33.8	---	4.7	4.2	42.0
1960	32.4	---	4.3	4.8	41.5
1961 4/	26.2	---	5.4	4.3	2/35.9

1/ Totals computed from unrounded data. 2/ Reported factory consumption, which exceeds the computed domestic disappearance. 3/ Less than 50,000 pounds. 4/ Preliminary.

Table 21.--Tung Oil: Western Hemisphere supplies and requirements, estimated 1957/58-1961/62 and forecast 1962/63

Supply & Distribution	Estimated					Forecast
	1957-58	1958-59	1959-60	1960-61	1961-62	1962-63
	Million pounds	Million pounds	Million pounds	Million pounds	Million pounds	Million pounds
Carryovers:						
United States (November 1)	24.8	36.9	38.5	1/ 37.3	8.2	13
Argentina (August 1)	18.8	25.1	14.1	11.0	19.3	9
Paraguay (August 1) 2/	1.1	3.4	2.7	1.7	1.0	---
Total	44.7	65.4	55.3	50.0	28.5	22
Production:						
United States (Nov.-Oct.)	25.5	44.8	34.0	13.0	33	6
Argentina (August-July)	50.7	31.5	39.4	47.5	29	37
Paraguay (August-July)	9.0	5.7	7.7	10.0	7	7
Brazil 3/	1.4	.3	.5	1.0	1	---
Total	86.6	82.3	81.6	71.5	70	50
Total supplies	131.3	147.7	136.9	121.5	98	72
Domestic distribution 4/						
United States	37.7	47.5	42.0	41.6	36	33
Argentina and Paraguay	2.7	2.7	2.7	3.0	3	3
Total	40.4	40.2	44.7	44.6	39	36
Net exports 4/	25.5	42.2	42.2	48.4	37	24
Total requirements, excluding carryovers	65.9	92.4	86.9	93.0	76	60

1/ May include more than 4 million pounds sold by CCC for export but not shipped November 1, 1960.
2/ Includes exports in U. S. bonded warehouses on August 1.
3/ Exports only.
4/ Producing countries only. Net exports include shipments to other Western Hemisphere countries.

For a number of years, a continuing larger proportion of Red China's tung oil crop is believed to have been utilized behind the Iron Curtain. This trend was accentuated by serious drouth and low production in recent years. Consequently, unless Red China, the largest exporter, returns to the free world market in a major way in 1963, world prices will remain unusually high.

Western Hemisphere Tung Oil Supplies Down Fourth Consecutive Year

Tung oil supplies in the Western Hemisphere (United States, Argentina and Paraguay) declined from 148 million pounds in 1958-59 to roughly 72 million pounds in 1962-63 (table 21). Carryovers from 1961-62 totaled only 22 million pounds or one-third those of 1958-59; production, at 50 million pounds, is down 30 million pounds from normal in North and South America.

As indicated above, total U. S. supplies of tung oil (production and stocks) in 1962-63 are placed at about 19 million pounds, whereas estimated 1962-63 domestic requirements are around 33 million pounds. This means the balance for consumption and stocks must be imported from Argentina and Paraguay. Such import supplies can be forthcoming only at the expense of Europe, which competes with the United States for the oil. Table 21 illustrates the tight situation as it has developed in the past 5 years.

The rise in annual requirements from Western Hemisphere production after 1957-58 followed a decline of oil shipments from Mainland China. As a result, total required quantities from Western Hemisphere output have exceeded production for 5 years. A drop in U. S. production accentuated this disparity between output and requirements. The situation this year means that consumption and stocks out of Western Hemisphere output must decline even more than was necessary in 1961-62. A return to normal production levels in 1963-64 will not end this deficit, if consumers attempt to return to former levels of tung oil usage.

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